Framework for FACDQ Discussion on
Measurement Quality Objectives (MQO)
March 10, 2006

Introduction
The federal advisory committee (FACDQ) has discussed the importance of Measurement Quality Objectives or
MQO's several times. MQO's are considered to be:

- False Positives
- False Negatives
- Accuracy (Bias)
- Precision

Since the December 2005 FACDQ meeting, the Policy and Technical Work Groups and their subgroups have
discussed whether or not setting specific MQO's is important for conducting a meaningful pilot study. They
have concluded that agreement on MQOs is needed.

The Policy Work Group has recognized, in addition, that MQO's are needed for developing FACDQ
recommendations to EPA on long-term detection and quantitation approaches in Clean Water Act programs.
They have further recognized that the choice of MQO's is a policy decision and that, in conjunction with
FACDQ decisions on the uses of detection and quantitation, MQOs will provide the framework for the advisory
committee's ultimate recommendations.

Therefore, both the Policy and Technical Work Groups recommend that the FACDQ discuss and agree on
MQO's as soon as possible, preferably at the March FACDQ meeting.

During a March 10 call of the Policy Work Group's MQO Subgroup, participants discussed MQOs and gained a
better understanding of differing viewpoints, but the Subgroup did not reach agreement on specific MQOs to
recommend to the FACDQ. Rather, the Subgroup proposed to provide the FACDQ with the following
documents to aid in discussion and decision on MQO's:

- The worksheet below with a range of options and space for caucuses to identify their preferred MQO
  values
- Template on MQO's and their Implications
- A summary of Technical Work Group reasons for setting MQO's before commencing a pilot test
- MQO's – Straw Proposal with Comments (Mary Smith developed a straw proposal for MQOs; David
  Kimbrough, John Phillips, and Nan Thomey provided comments on the straw proposal.)

The Subgroup recommended that the FACDQ approach this discussion in the context of making decisions that
will apply to long-term recommendations. The Subgroup also recommended that the FACDQ select MQO's for

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Federal Advisory Committee on Detection and Quantitation Approaches and   1
Uses in Clean Water Act Programs
Framework for FACDQ Discussion on Measurement Quality Objectives (MQO)

a use that has the least tolerance for uncertainty and picked the compliance/enforcement use, although there was some interest in the reasonable potential use.

The majority of the group felt that the FACDQ should have one set of MQO's for all uses. The FACDQ may want to discuss this issue and seek consensus on the best approach.

The worksheet below is provided for caucus use before the March 29-30 FACDQ meeting and during caucus breakouts at the meeting. The values in the worksheet represent the range of options identified during MQO Subgroup discussions.

Goals	Values	Perspectives and Initial Preferences for L_C						Rationale for Selection
		EPA	Labs	Public Utilities	Industry	Environ-mental Com-munity	States	
Alpha - False Positive error rate at L_C	0%							
	0.5%							
	1%							
	5%							
	Other Options							

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Framework for FACDQ Discussion on Measurement Quality Objectives (MQO)

Comments	The subgroup recommended that false positives be set at 1% (frequency) but that for any individual batch, no blanks with results greater than two times Lc (magnitude) would be acceptable or the blank and all sample results associated with the batch would be rejected	

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Framework for FACDQ Discussion on Measurement Quality Objectives (MQO)

3

Goals	Values	Perspectives and Initial Preferences for L_D						Rationale for Selection
		EPA	Labs	Public Utilities	Industry	Environ-mental Commun -ity	States	
Beta-False Negative Error Rate at L_C	1%							
	5%							
	50%							
	No need to establish a false negative rate							

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Uses in Clean Water Act Programs
Framework for FACDQ Discussion on Measurement Quality Objectives (MQO)

4

Comments	When you set Ld, you are determining the concentration at which the false negative rate is some specified value (1%, 5%, etc.), based on making the detection decision at Lc.	
	Note: At the September, 2005 FACDQ meeting the following definition was agreed upon for L_Q. Therefore the detection limit (L_D) must be defined in order to know the lower bound for L_Q.	
	"Quantification Limit (L_Q): The smallest detectable concentration of analyte greater than the detection limit where the required accuracy (precision & bias) is achieved for the intended purpose."	

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5

Goals	Values	Perspectives and Initial Preferences for L_Q						Rationale for Selection
		EPA	Labs	Public Utilities	Industry	Environ-mental Commun-ity	States	
Accuracy at L_Q	100 +/- 10%							
	100 +/- 20%							
	100 +/- 40% for inorganics & VOCs							
	100 +/- 50% for SOCs							

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Uses in Clean Water Act Programs
Framework for FACDQ Discussion on Measurement Quality Objectives (MQO)

6

Comments		

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Framework for FACDQ Discussion on Measurement Quality Objectives (MQO)

7

Goals	Values	Perspectives and Initial Preferences for L_Q						Rationale for Selection
		EPA	Labs	Public Utilities	Industry	Environ-mental Com-munity	States	
Precision % RSD at L_Q	+/-10%							
	+/-20%							
	+/-40%							
	No need to establish preci-sion							

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Framework for FACDQ Discussion on Measurement Quality Objectives (MQO)

8

Comment s	Approximately 68% of the results are within the range of +/- one %RSD. Approximately 95% of the results are within the range of +/- two %RSD. Approximately 99% of the results are within the range of +/- three %RSD.	

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Framework for FACDQ Discussion on Measurement Quality Objectives (MQO)

9